

Stored Product Pests Warehouse Beetle

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Just the Facts...

Warehouse beetles (*Trogoderma variable*) are serious pests infesting stored food and are often difficult to control. This beetle gets its common name from the fact that it is very common in warehouses storing food items. Both the adults and larvae prefer animal protein, woolen fabrics, and hides, but will readily feed on any product of animal or plant origin to include cereals, flour, cake and pancake mixes, spices, chocolate, powdered milk, and dry animal food. Warehouse beetles are often found in grain based anticoagulant baits commonly used for rodent control.

What do they look like? The warehouse beetle adults are small, only 1/8-inch in length and are dark with yellow to brown patches on the body. The larvae are approximately 1/4-inch in length and orange-brown in color with sharply protruding hairs. The warehouse beetle closely resembles the Khapra beetle, a federal quarantine pest that is currently found overseas. Always send suspected warehouse beetles to a pest management professional or extension agent for identification to determine if the insects are Khapra beetles.

How do they get in? Warehouse beetles are free-living in the environment and often spend the winters in bird and wasp nests. They are good fliers and readily invade warehouses seeking food. They are also brought into food warehouses (commissaries), retail outlets (exchanges and shoppettes), and homes in infested grocery products and dry animal food. Although warehouse beetles can fly, they are usually transported inside food packages. The beetles may also be found on the outside of pallets containing food products and between boxes and bags of food on palletized cargo. The increased use of air-tight plastic or foil bags and pouches has minimized warehouse beetle infestations during transit and storage since the insects cannot chew through the packaging. Dry animal food is more susceptible since many packages are not "air-tight" and exhibit small openings which permit warehouse beetle entry.



Adult and Larval warehouse beetles, University of Nebraska, Lincoln, Department of Entomology



Trogoderma variable, warehouse beetle, Danielle Thomas, ORISE Fellow, Entomological Sciences Program, USACHPPM

Where do they live? The beetles live inside the products, but adults will often leave the food to seek mates. Adult beetles are often found along window sills. This may be the first sign that a warehouse is infested, but it will not *indicate* which products contain beetles or where infested products are located. Warehouse beetles are also found in spilled food in cracks and crevices and seams on the floors in shipping containers, rail cars, and trucks.

Do they multiply? Yes. The adult female lays approximately 90 eggs. The life cycle varies from 2-4 months, and the adult beetles normally live from 9-50 days to a maximum of 100 days. If left unchecked, beetles from a single infestation can quickly spread to other susceptible products in warehouses, stores, or homes.

What damage do they cause? The larvae can chew through plastic wrappers, aluminum foil, and airtight plastic containers making most dry food products in warehouses, kitchen, and pantries susceptible to infestation. Sharp hairs on the larvae break off the cast skins and can lodge in the throats and intestinal linings of humans and pets. Ingestion of the hairs often causes vomiting and diarrhea that persists for several days. Continued ingestion of larval hairs can lead to chronic diarrhea, particularly in pets when insects infesting dry animal food are undetected. The hairs can also produce an allergic reaction in sensitive individuals.

Prevention methods. Sanitation and inspection are the keys to good warehouse beetle control. Pheromone traps are useful in determining if the beetles are active in warehouses, but they will not indicate the location of infested products. Inspect pallets of food upon arrival at warehouses, and inspect individual products when brought home from retail outlets. Adult insects or holes in packages are indications of infestations. Inspect salvage areas in food warehouses since spillage from broken packages is more common than in the storage areas. Check rodent bait stations weekly to ensure grain-based baits are not infested.

Control methods. Inspect and clean vehicles used to transport food to remove spilled material. Remove spilled food daily and clean warehouses with a vacuum monthly, especially along walls and the edges of pallets where beetles and food products tend to accumulate. Place food pallets at least 18 inches from walls to permit routine inspection and cleaning. Rotate food products so that older stocks are sold first; frequently inspect food with older manufacturing dates for infestations since adult beetles tend to emerge from packages in greater numbers as the infestation ages. This principle also applies in the home since beetles from a single infested product can migrate and infest multiple food products stored in a kitchen or pantry. Store infestible products in containers with tight fitting lids if the contents are not used within one week after opening. Place infested products inside plastic bags prior to disposal to reduce the spread of adult beetles. Segregate infested products in warehouses from non-infested products and cover with plastic until treatment or disposal. Place infested products in a freezer at 0 degrees Fahrenheit for 4 days to kill adults, larvae, and eggs. Do not reissue infested products or use for food preparation even after beetles are killed since freezing has no adverse affect on the larval hairs that cause medical problems when ingested. Infestations can also occur when rodents are present. Mice will accumulate dry animal food, crackers, and cereal in harborage and nesting areas which may be inaccessible (behind walls or under cabinets). Rodent control and pesticide treatment in void areas may be the only way to eliminate warehouse beetle infestations in homes after efforts to inspect and locate infested products in kitchens or pantries have failed. Warehouse beetle larvae can go into diapause for up to two years when environmental conditions are unfavorable, such as cool temperatures or lack of food. This poses a problem in warehouses when larvae are well hidden in cracks, crevices, or other voids which often go unnoticed, are difficult to clean, and protect the larvae from surface insecticide sprays. Give special attention when inspecting, cleaning, or applying insecticides to floor/wall junctions and permanently mounted door jambs, tracks, and shelving posts/pillars. Thoroughly inspect stored products that are shipped from overseas locations including food that is retrograded from military installations or operational bases. The warehouse beetle is similar in appearance to the Khapra beetle, a significant stored products pest since eradicated from the United States. Ingestion of larval hairs of this species, like the warehouse beetles, may result in medical problems. The Khapra beetle has the ability to live without food or subsist on low moisture food for extended periods of time. It also seeks out secluded hiding places (e.g., cracks and crevices) that are difficult to clean and is resistant to a variety of pesticides. Always send suspected warehouse beetles to a pest management professional or extension agent for identification to determine if the insects are Khapra beetles.

For more information on surveillance and control of stored product pests, see the Armed Forces Pest Management Board Technical Guide No. 27, Stored-Product Pest Monitoring Methods, June 2005, and Technical Guide No. 38, Protecting Meal, Ready-to-Eat Rations (MREs) and Other Subsistence During Storage, June 2005 at <http://www.afpmb.org/pubs/tims/tims.htm>.